CLAIMS

We claim:

1. A micro acoustic spectrum analyzer for determining the frequency components of a fluctuating sound signal, comprising:

a microphone to pick up the fluctuating sound signal and produce an alternating current electrical signal;

at least one microfabricated resonator, each resonator having a different resonant frequency, that vibrates in response to the alternating current electrical signal; and

at least one detector to detect the vibration of the at least one microfabricated resonator.

2. The micro acoustic spectrum analyzer of Claim 1, further comprising a mixer to mix a reference signal with the alternating current electrical signal from the microphone to shift the frequency spectrum of the alternating current electrical signal to a frequency range that is a better matched to the resonant frequencies of the at least one microfabricated resonator.

3. The micro acoustic spectrum analyzer of Claim 1, further comprising means for storing and scanning the detected vibrations from each of the at least one detector.

4. The micro acoustic spectrum analyzer of Claim 1, further comprising a pattern recognition processor to compare the detected vibrations from the at least one detector to a library of profiles.

5. The micro acoustic spectrum analyzer of Claim 1, wherein the microphone comprises a hydrophone.

6. The micro acoustic spectrum analyzer of Claim 1, wherein the at least one microfabricated resonator comprises silicon-based materials.

7. The micro acoustic spectrum analyzer of Claim 1, wherein the resonant frequency of the at least one microfabricated resonator is greater than 20 kHz.

10. The micro acoustic spectrum analyzer of Claim 1, wherein the at least one microfabricated resonator comprises an electromagnetic resonator.

11. The micro acoustic spectrum analyzer of Claim 8, wherein the electromagnetic resonator comprises a flexural plate wave resonator.

12. The micro acoustic spectrum analyzer of Claim 8, wherein the electromagnetic resonator comprises a teeter-totter resonator.

13. The micro acoustic spectrum analyzer of Claim 8, wherein the electromagnetic resonator comprises a xylophone resonator.

14. The micro acoustic spectrum analyzer of Claim 1, wherein the at least one microfabricated resonator comprises a tunable resonator having a resonant frequency and a bandwidth that can be adjusted electrically.

15. The micro acoustic spectrum analyzer of Claim 12, wherein the electrical adjustment comprises a capacitor-based circuit.

16. The micro acoustic spectrum analyzer of Claim 1, wherein the at least one detector is selected from the group consisting of a current-viewing resistor, capacitance means, and optical means.